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## Remarks

Claims 1-9, 13-19, and 28-46, and 56-64 are pending. Claims 10-12, 20-27, and 47-55 were withdrawn from consideration on the basis of the species requirement. No amendments are made herein in view of this response. Reconsideration of the application is requested.

the application. Claims based on an election of matter has been added by view of this response is

## Claim Rejections— 35 U.S.C. (b)

The Examiner rejects claims 1-5, 13, 15, 17, 40, and 56-60 under 35 U.S.C. § 102(b), as being anticipated by Dent. Claim

1. An electronically tuned circuit, comprising a power amplifier coupled to an electronically tunable output network, said power amplifier capable of being operated in a large-signal mode, said output network including an electronically tunable reactive component, wherein electronic tuning of said electronically tunable reactive component includes non-monotonic electronic tuning when said power amplifier is operated in said large-signal mode, further wherein a control line extends to said electronically tunable reactive component for electronically varying reactance of said reactance component over more than two values.

The examiner states "applicant adds to the control line that extends to the electronically tunable reactive component for electronically varying the reactance over more than two values. Clearly the control line of Dent is capable of supplying more than two values."

Applicant would respectfully ask the Examiner to consider that Dent would not work for its intended purpose if the control line 44 in FIG. 2 or control line 50 to switch 76 in FIG. 3 varied over more than two states. The purpose in Dent to provide high efficiency and lossless reactance would be degraded. Dent provides the embodiment with fixed or variable reactance 42 or 74 with a switch. As intended by Dent, the switches of FIGS. 2 and 3 provide more than two states for reactances 42 and 74. In one case the switch is closed, providing a state of reactance 42 or 74. In the other case switch is open, providing that side of reactance 42 or 74 disconnected from ground and floating. Dent teaches "maximum efficiency," as described throughout his background and detailed description. In particular, from column 5 from line 14 to line 61, Dent clearly describes the

In another preferred embodiment of the present invention, a harmonic

Docket No. GMRR PA00-3

Page 14 of

09/610,933

filter network 32 is located between the power impedance 26 as shown in FIG. 3. The filtering network 32 includes a number of lossless reactances 60, 62, 64, 66, 68, 70, 72, 74 in the form of capacitors and inductors. These reactances are usually fixed and designed to minimize the loss to the desired signal at the particular transmission frequency. In conventional applications, the filtering network 32, these reactances are switched to change the operating frequency of a harmonic filter or an antenna matching network. However, in this preferred embodiment according to the invention, at least one switched or otherwise variable reactance element 74 is introduced into the matching network by a switch 76 or other variance device controlled by a control line 50. The control line 50 may be connected to a manual switch or to a suitable control device. The reactance element 74 may have a fixed or variable reactance. One example of a variable reactance is a varactor diode. Other examples include a fixed reactance 74 or electronic switch may be switched into the network by a manual or electronic switch such as a PIN diode.

The switched or variable reactance element 74 is used to vary the load impedance in order to obtain a different power level and still maintain a high efficiency. The magnitude of the switched reactance element 74 as well as the other reactances within the matching networks 32 are selected so that in a first modulation mode when the switch 76 is open, the load impedance is a resistive load  $R_{sub.1}$ . In the second modulation mode, corresponding to the switch 76 being closed, the overall load impedance is a resistive impedance  $R_{sub.2}$ . The resistive load impedances  $R_{sub.1}$  and  $R_{sub.2}$  are selected such that the power supply voltage to obtain two distinct output levels at maximum efficiency in both of the constant amplitude modulation and the amplitude modulation modes.

Because switching a resistance/conductance into the circuit simply absorbs power and reduces efficiency, the matching network must be changed by switching a lossless reactance into or out of the circuit. Consequently, the filter network must be designed such that a change in susceptance switched across the P to ground results in a change of resistance from  $R_1$  to  $R_2$  as seen by the power amplifier 21.

Thus, it is clear that there are only two states of the control line of FIG. 2 or 3, an off voltage state and an on voltage state. In the off voltage state, the switch is open so no RF signal passes through reactance element 74. With zero RF current flowing zero power is dissipated. In the fully on state, the switch is closed, and if the resistance of switch 44 or 76 is low, the loss is low. Any intermediate

voltage between these two values would provide for flow resistive switch, producing more loss and lower efficiency and high efficiency, Dent expressly teaches against this

Also, any voltage higher than the value needed more negative than the value needed to provide "off" switching device 44 or 76 without changing the output. Nothing useful would be accomplished, and lifetime of Dent does not teach or suggest providing such excess detract from his purpose. Thus, applicant would respect that to achieve the maximum power efficiency and avoid the teachings and suggestions of Dent require two and the control line to control switches 44 and 76.

Furthermore, Dent states that "reactance element 74." Although of course a variable reactance element and Dent discloses the idea of using a variable reactance element in a two-terminal device, Dent shows no way of varying the reactance of element 74 in his circuit. Nor does he teach or suggest varying the reactance of element 74 electronically. Nor does he teach or suggest electronically varying the reactance of element 74 to more than two values. Dent does not teach or suggest electronically varying the reactance of element 74 or providing a control line to element 74 or in FIGS. 2 or 3. Instead Dent provides in FIG. 2 a control line 50 to element 74 and, in FIG. 3, control line 50 to switching element 74. Nor does he suggest electronically varying the reactance of element 74 to more than two values. Although reactance element 74 is a variable reactance element, Dent only teaches switching reactance element 74 to two values, the reactance of circuit 32, and in doing so Dent is varying the reactance of element 74 to just two values.

Claims 1, 40, and 56 all include the limit, **an electronically tunable reactive component for electronic control of the reactive component over more than two values**. Thus, these claims are clearly distinguished from the prior art. Dent, and the rejection under 35 U.S.C. § 102(b), is traversed.

Furthermore, there is no teaching or suggestion adapted to be tuned to a selected frequency, a fixed frequency, or a frequency described in claims 2 and 57.

Nor is there teaching or suggestion in De to be adjusted to maintain a match with a varying

Docket No. GMRR PA00-3

Page 16 of 17

09/610,933

3 and 58. Instead Dent has a fixed load impedance, his impedance of the filter located between the power amplifier and the antenna to change the impedance seen by the power amplifier, as described in column 4, lines 14-15 and lines 53-55.

Nor there is there teaching or suggestion in Dent adapted to modulate the signal, as provided in claim 4. already modulated, as described in Dent in col 4, lines 14-15, received by a power amplifier 21 for amplification to a frequency transmission." While of course a filter, as used in the characteristics of the wave traveling through the filter to remove undesirable harmonics or signals interfering at certain frequencies (column 4, lines 45-47), the phrase "adapted to modulate" in its ordinary meaning involves adding information to the signal or providing a variable input to the signal. Dent does not teach or suggest adding a second signal. Dent does not teach or suggest modulating the signal, or add information to the signal. Dent's filter passes the signal through it in the same way. Therefore Dent's filter does not modulate the signal.

Nor there is there teaching or suggestion in Dent providing a signal to control the electronically tunable network as described in claims 28 and 60.

Nor there is there teaching or suggestion in Dent providing a bias input for setting the bias level of the power amplifier in which the bias is adapted to the minimum level necessary to enable operation of the power amplifier as described in claim 38.

Nor there is there teaching or suggestion in Dent providing the output network including at least two reactive components connected in a parallel resonant circuit, wherein at least one of the reactive components is adapted to being electronically tuned by a tuning signal, as described in claim 60.

Therefore the rejection of claims 1, 40, 47 and 58 under 35 U.S.C. § 102(b), as being anticipated by the prior art, is maintained.

#### Claim Rejections— 35 U.S.C. § 103(a)

The Examiner rejects claims 6-9, 14, 17-19, 22, 38, 41-46, and 61 under 35 U.S.C. § 103(a), as being unpatentable over Dent. The Examiner to consider that independent claims 1, 40, 47, and 58, include the limit, "wherein a control line extends to said electronically tunable reactive component for electronically varying reactance of said reactance over more than two

and he switches the antenna to change the impedance seen by the power amplifier, as described in column 4, lines 14-15 and lines 53-55.

provide the output network which at least amplifies a signal that is already modulated, as described in Dent in col 4, lines 14-15, received by a power amplifier 21 for amplification to a frequency transmission." While of course a filter, as used in the characteristics of the wave traveling through the filter to remove undesirable harmonics or signals interfering at certain frequencies (column 4, lines 45-47), the phrase "adapted to modulate" in its ordinary meaning involves adding information to the signal or providing a variable input to the signal. Dent does not teach or suggest adding a second signal. Dent does not teach or suggest modulating the signal, or add information to the signal. Dent's filter passes the signal through it in the same way. Therefore Dent's filter does not modulate the signal.

provide a controller for controlling the electronically tunable network as described in claims 28 and 60.

provide a bias input for setting the bias level of the power amplifier in which the bias is adapted to the minimum level necessary to enable operation of the power amplifier as described in claim 38.

provide the output network including at least two reactive components connected in a parallel resonant circuit, wherein at least one of the reactive components is adapted to being electronically tuned by a tuning signal, as described in claim 60.

and claims dependent thereon, the rejection of claims 1, 40, 47 and 58 under 35 U.S.C. § 102(b), as being anticipated by the prior art, is maintained.

#### 35 U.S.C. § 103(a)

2, 38, 41-46, and 61 under 35 U.S.C. § 103(a), as being unpatentable over Dent. The Examiner to consider that independent claims 1, 40, 47, and 58, include the limit, "wherein a control line extends to said electronically tunable reactive component for electronically varying reactance of said reactance over more than two

values." As discussed above under the 102 rejections Dent provides a switch that allows only two states. His description does not teach or suggest adding additional states. Dent's switch provides more than the two states Dent provides. Further, a switch would not be obvious from Dent since adding such a requirement to Dent's on-off switching scheme. Further invention would be required to provide additional states. Thus, the rejection of claims 1, 40, 47, and 56 are not traversed. 35 U.S.C. § 103(a), as being unpatentable over Dent has been traversed.

The Examiner rejects claims 30, 33, and 34 as being unpatentable over Dent in view of Hotta. Neither Dent teaches or suggests the limit, "wherein a control line of a reactive component for electronically varying reactance over more than two values." Thus, the rejection of claims 30, 33, and 34 is dependent thereon, including claims 30, 33, and 34 has been traversed.

Claim 47 was previously amended to be dependent on claim 1. Therefore, applicant requests that the species be rejoined if claim 1 is allowable.

The prior art made of record and not relied upon has been reviewed and is not pertinent to the claims.

It is believed that the claims are in condition for allowance. Therefore, applicant respectfully requests favorable reconsideration. If there are any questions please call applicant's attorney at 802 864-1575. Applicant requests an opportunity to discuss this draft amendment with the Examiner at his earliest convenience. Thank you very much for your attention to this matter.

Respectfully submitted,

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Docket No. GMRR PA00-3

Page 18 of 18

09/610,933

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